



# Modeling Overwintering Survival of Declining Landbirds on DoD Installations by Habitat

06-186

## Background:

Many landbird species that overwinter in temperate North America are declining. Many of these species may be limited by factors acting during the non-breeding season, yet little is known about the factors that influence winter habitat quality. With funding from the DoD Legacy Program, The Institute for Bird Populations initiated the Monitoring Avian Winter Survival (MAWS) program on four southeastern U. S. military installations during winter 2003-04 to identify factors that affect habitat quality for overwintering birds. The four-year pilot phase of this monitoring effort was completed in winter 2006-07.



Banders collecting data on overwintering birds at a MAWS station on Camp Joseph T. Robinson, Arkansas (Photo by Margaret Muenich).

## Objective:

Overall goals of the MAWS program are the identification of factors that affect avian winter habitat quality and the development of habitat management strategies to reverse bird population declines. The program aims to: (1) provide estimates of apparent winter survival (site persistence), between-year apparent survival (site fidelity), and indices of physical condition for a suite of target landbird species at multiple spatial and temporal scales; (2) develop models of apparent survival and body condition as functions of local and landscape-scale habitat variables; and (3) develop avian management guidelines.

## Summary of Approach:

Six monitoring stations were established on each of four military installations: Fort Bragg, NC; Fort Benning, AL/GA; Camp Robinson, AR; and Fort Chaffee, AR. Stations spanned a continuum of habitat types, from mostly-forested to predominantly grassland or shrubland. We established mist-net sites at each station and banded birds during monthly 3-day pulses of field work between November and March of 2003-04, 2004-05, 2005-06, and

2006-07. A few target species were color-banded, and for these intensive re-sighting efforts and behavioral observations were conducted. Residency status of all bird species encountered at each station in each winter was recorded. We completed habitat maps and descriptions for each station and extracted and land cover metrics within 1-km of the center of each station from the National Land Cover Dataset (NLCD 2001). State-of-the-art analytical methods were employed to link avian survival rates and body condition to habitat variables.

## Benefit:

Many declining bird species monitored by MAWS inhabit edge, shrub, and grassland habitats that are also favored for military training activities, MAWS offers a unique opportunity to develop management prescriptions that benefit bird populations and the military's mission of Readiness and Range Sustainment. Results will also aid in the development of Integrated Natural Resources Management Plans (INRMPs) for each installation. INRMPs aim to ensure that military operations and natural resource conservation are integrated and consistent with stewardship and legal requirements.

## Accomplishments:

Over 20,000 birds of 70 species were banded as part of the pilot MAWS program and more than 6,000 pulse-unique were recorded. We estimated apparent survival rates for 25 target landbird species at installation- and/or station-levels. For a subset (10 species), we completed age-specific analyses of apparent survival and body condition that incorporated habitat effects. We detected differences in body condition among installations for each of the 10 species; installation differences in apparent survival were suggested for one species. Links between body condition and habitat were strong for 9 species. Body condition was (typically) positively related to patch size, deciduous cover, and grassland/ herbaceous edge; and negatively related to land cover diversity, evergreen/ mixed forest, and number of cultivated crop patches. Links between apparent survival and habitat were not as strong (detected for 3 species), but suggested possible benefits of increased evergreen/mixed forest, woody wetland, and some forms of (low-level) development.

## Contact Information:

Name: James F. Saracco, Ph.D.  
Title: Research Ecologist  
Org: The Institute for Bird Populations  
Address: P.O. Box 1346  
Point Reyes Station, CA 94956-1346  
Phone: (415) 663-2054  
Fax: (415) 663-9482  
Email: jsaracco@birdpop.org